

CLAIMS

What is claimed is:

1. An assembly method for a semiconductor die and a portion of a lead frame comprising:
providing the lead frame having a plurality of lead members, each lead member of said plurality of lead members having a lead end portion connected to a portion of the lead frame, said each lead member of said plurality of lead members having a length, having a thickness, and having a free end portion;
forming a stress relief portion in the plurality of lead members, said stress relief portion extending along the length of each lead member of the plurality of lead members between the free end portion and the lead end portion thereof, said stress relief portion having a predetermined length and depth extending into the thickness of each lead member of said plurality of lead members for each lead member to have an amount of flexure, said stress relief portion formed by one process of a machining process, an etching process, a process using an electron beam, and a deforming process;
providing a die having an active surface, having a plurality of outer edges, having a width, having a length greater than the width, and having a plurality of bond pads extending along a center portion of the active surface along the length of said die, at least one bond pad of the plurality of bond pads for connection to said plurality of lead members;
providing adhesive;
placing the adhesive continuously without interruption throughout a portion of the active surface of said die extending from adjacent each side of the plurality of bond pads except for a portion of the active surface of said die adjacent the plurality of outer edges of said die from which said plurality of lead members extends from the lead end portion over at least one outer edge of the plurality of outer edges of said die having the free end portion thereof located adjacent the at least one bond pad of the plurality of bond pads;

superimposing said lead frame on said die with said active surface facing said lead frame and the plurality of lead members extending over the active surface of said die, said stress relief portion of the plurality of lead members extending from adjacent the at least one outer edge of the plurality of outer edges of said die, extending over a portion of the active surface of said die having no adhesive thereon, and over a portion of the adhesive on a portion of the active surface of said die;

securing said plurality of lead members to the portion of the active surface of said die using the adhesive;

allowing a portion of said plurality of lead members to be unsecured to the portion of the active surface of said die having no adhesive thereon;

providing an area located between the portion of the active surface of said die having no adhesive thereon and the stress relief portion of said plurality of lead members having an enlarged space compared to a space between the portion of the active surface of said die having adhesive thereon and the stress relief portion of said plurality of lead members; and

sizing said area for allowing passage of filler particles of molding material therethrough in a transfer molding operation for preventing damage from said filler particles by said transfer molding operation to the portion of the active surface of said die having no adhesive thereon and allowing an amount of flexure for movement of said plurality of lead members with respect to said die by allowing passage of said filler particles from said area.

2. The method of claim 1, further comprising:

coining the stress relief portion in the length of said plurality of lead members.

3. The method of claim 1, further comprising:

stamping the stress relief portion in said plurality of lead members.

4. The method of claim 1, wherein said forming the stress relief portion comprises

forming a thinned portion along a length of said plurality of lead members.

5. The method of claim 4, wherein said forming said thinned portion comprises providing a predetermined amount of flexure.

6. The method of claim 5, wherein said providing the amount of flexure includes providing bending and torsional flexure.

7. An assembly method for a semiconductor die and a lead frame having a plurality of leads, said method forming an assembly having said plurality of leads of said lead frame fixed in position with respect to said semiconductor die and having material in a molding operation having filler particles therein surrounding a portion of said plurality of leads and said semiconductor die, said method comprising:

providing said lead frame having a plurality of lead members, each lead member of said plurality of lead members having a lead end portion connected to a portion of said lead frame, said each lead member of the plurality of lead members having a length, having a thickness, having a lead end, and having a free end portion;

forming a stress relief portion in said each lead member of the plurality of lead members, said stress relief portion extending along said length of said each lead member of said plurality of lead members between said free end portion and said lead end portion thereof, said stress relief portion having a predetermined length and depth and amount of flexure;

providing a die having an active surface, having four outer edges, having a width, having a length larger than said width, having a plurality of bond pads extending along a center portion of said active surface along said length of said die, said plurality of bond pads for connection to said plurality of lead members;

providing an adhesive;

applying said adhesive continuously without interruption throughout a portion of said active surface of said semiconductor die extending from adjacent each side of said plurality of bond pads except for a portion of said active surface adjacent said four outer edges of the

semiconductor die, said each lead member of said plurality of lead members terminating adjacent at least one bond pad of said plurality of bond pads;

superimposing said lead frame on said die with said active surface facing said lead frame and said plurality of lead members extending over said active surface of said die, said stress relief portion of said each lead member of said plurality of lead members extending from adjacent at least one outer edge of said die, over a portion of said active surface of said die having no adhesive thereon, and over a portion of said adhesive on a portion of said active surface of said die;

securing said each lead member of said plurality of lead members to a portion of said active surface of said die using said adhesive;

allowing a portion of said each lead member of said plurality of lead members to be unsecured to said portion of said active surface of said die having no adhesive thereon;

providing an area located between said portion of said active surface of said die having no adhesive thereon and said stress relief portion of said each lead member of said plurality of lead members having an enlarged space compared to a space between said portion of said active surface of said die having adhesive thereon and said stress relief portion of said each lead member of the plurality of lead members; and

sizing said enlarged space for allowing substantially free passage of material having said filler particles therein through said enlarged space in a transfer molding operation, said enlarged space for preventing damage from said filler particles to said portion of said active surface of said die having no adhesive thereon and allowing an increased amount of said flexure for movement of said each lead member of said plurality of lead members with respect to said die by allowing free passage of said filler particles through said enlarged space in said transfer molding operation.

8. The method of claim 7, further comprising:

cantilevering each lead member of the plurality of lead members to extend over said active surface of said die wherein said stress relief portion of said at least one lead member

extending along a portion of a length of said at least one lead member extends over a portion of said active surface to adjacent said at least one outer edge of said die.

9. The method of claim 7, wherein said securing said each lead member of said plurality of lead members comprises adhesively securing said die by a layer of adhesive.

10. The method of claim 9, wherein said adhesively securing comprises securing said each lead member of said plurality of lead members to said die by at least one layer of adhesive applied to a strip of tape.

11. The method of claim 9, wherein said adhesively securing comprises securing said each lead member of said plurality of lead members to said die by at least one layer of adhesive applied to each side of a strip of tape.